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If The Sky Were The Limit, What Would You Do In Technology Transfer?

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Today we operate in a competitive global knowledge economy in which intangible assets are becoming an increasing determination of value. The federal laboratories are the research and development engine of the United States and have the capacity to further stimulate new innovations, products, companies and jobs through the creation of intellectual property, development of new technologies, and bold partnerships.

This need has been clearly recognized by the current Administration. In his presidential memo issued in October 28, 2011, President Obama states that "Innovation fuels economic growth, the creation of new industries, companies, jobs, products and services, and the global competitiveness of U.S. industries. One of the goals of my Administration…is to foster innovation by increasing the rate of technology transfer and the economic and societal impact from Federal research and development investments. The aim is to increase the successful outcomes of these activities significantly over the next 5 years."[1] This memorandum focuses on the need for new policy to establish goals and measure progress, streamline the federal government's technology transfer and commercialization process, and facilitate commercialization through local and regional partnerships.

[1]Presidential Memorandum—Accelerating Technology Transfer and Commercialization of Federal Research in Support of High-Growth Businesses, October 28, 2011.

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The Federal Laboratory Consortium for Technology Transfer (FLC) is the nationwide network of approximately 300 federal laboratories and their parent agencies. The FLC provides a forum to develop strategies and explores ways to link laboratory technologies and expertise with the marketplace. Organized in 1974 and formally chartered under the Federal Technology Transfer Act of 1986, the FLC has a mission to strengthen technology transfer nationwide.[2] The mission and programs of the FLC are intended to support the mission as outlined by the Presidential memorandum. Input from the members and their industry partners have the potential to guide the enhancement of existing programs and resources and the development of new initiatives.

For the Federal Laboratory Consortium Annual Meeting from April 30th to May 3rd 2012, Bridging Federal Technologies and Industry, a panel was established from industrial partners, technology transfer and economic development leaders, to consider the question, “If the sky were the limit, what could the federal labs do differently to accelerate technology transfer?” Prior to the session, the panel gathered issues and suggestions from professionals in technology transfer, industry, investors and the university community, and integrated these to stimulate the discussion. The goal of the panel was to generate a discussion on key areas and potential innovations to accelerate the achievement of the goals outlined in the presidential memo. With an audience comprised of technology transfer professionals committed to establishing best practices with the private sector, a stimulating discussion was generated to determine what key issues are and what can be done by the labs, agencies, industry, and economic development organizations to address them.

There were several key areas where opportunities for change were identified including culture, elevation and integration of mission, marketing communications and outreach, process, education, and entrepreneurship and commercialization. Following is a summary of the integrated responses on these topics including issues and recommended solutions as provided.

Culture

There is an opportunity to stimulate a culture of innovation and change in the federal laboratory system. A change in culture for technology transfer and commercialization was recommended that is not unduly weighted towards job creation and better aligned with the business objectives of the industry partners. As well, it is seen that a shift in culture towards focusing on community impact and interaction would be of service and raise the profile of the federal laboratories in their local and regional communities.

A need for change in the culture of the external perspective of the federal laboratories by industry was identified to further engage in exploring and licensing the technologies coming from the labs. Industry representatives suggested that the lab priorities can be better defined so that companies understand how to work with each lab more easily. Labs should take more time to clearly explain differences in their programs (licensing, access to research and development, policies, business models (*GOGO vs. GOCO*) and mission focus. It was also

[2] http://www.federallabs.org/

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recommended that increased flexibility in the laboratory systems (similar to universities) would make a difference.

Addressing culture from an internal perspective, it was commented that that a more aggressive philosophy is needed, to “get stuff out the door and don’t dwell on perfect!” Another cultural perspective is to think about the role of technology transfer as more customer-oriented and less bureaucratic in nature, and to shift the role of federal technology transfer professionals from gatekeepers to facilitators spending less time on management and administration and more time increasing technology transfer focused activities. Recommendations were also directed to agencies; find a more consistent way to operate with direction and intended outcomes at a federal level. At the federal and agency level the mandate should be to accelerate the transfer of intellectual property, eliminate the duplication of efforts and streamline the overall process.

Elevation and Integration of Mission

There was a consistent message on the importance of integrating technology transfer within and between labs as well as leveraging the management and resources of the network in a more efficient way. Clear integration and support of the importance of commercialization alongside research and development is clearly vital. This requires that technology transfer and commercialization missions are taken seriously, visibly supported by the senior executives of the laboratory and strongly conveyed to the lab scientists and engineers.

It is seen that FLC can take on a greater role to get the hundreds of federal labs better connected with each other and with industry. Examples provided are the creation of a site that links to all the federal laboratories to promote awareness, appropriate contacts, entrepreneurial programs and how to do business with the various labs. Other examples include the fostering of efforts like the Federal Tech Net and the Technology Transfer speaker series, both conducted in the FLC’s Mid-Atlantic Region.

Marketing Communications

Another discussion that really resonated with the group was that the FLC could help individual labs better communicate their approach and capabilities and make it easier to navigate the system. If federal labs saw clearer benefit from an integrated approach through FLC they could present a more uniform and consistent message and image. One of the recommendations is increased outreach to small businesses and entrepreneurs to establish personal connections. One approach presented is to work with the Department of Commerce (DOC) to identify needs among the approximately 3 million small businesses in the U.S. Information available through DOC and the Small Business Administration (SBA) could be more fully used to find out where these businesses are and what needs they have that can be served by the federal labs.

It was pointed out that FLC could establish a marketing arm and improve the FLC web-site to better feature national labs, their locations and their work to help both venture capitalists and businesses better navigate them. As well, a need for improved communications between technology transfer organizations and a transition from an organizationally fragmented to a

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unified messaging and communications across the federal laboratory system was identified. Recommendations included establishing common ground rules and tools and to increase and simplify communications with industry, perhaps using a Web-based portal that conveys information. A focus on listening better to potential customers rather than dictating the process and the rules to them was identified.

The importance of understanding and establishing involvement and integration with local and regional economic development was also stressed. This includes connecting technologies to economic development initiatives as well as labs educating their local economic development groups on the value of the labs. Economic development groups are typically more focused on the importance of the economic contributions made by universities. A progressive communication measure identified is getting out into the community, industry, and academic institution to break down the perceptions that national labs are formidable fortresses. This is seen as a way to escalate academic and industry partnering and mentoring.

Process

Today we live in a digital age with many resources to support better communication systems, networking, and partnering. The respondents identified the use of online technology transfer tools as a way to accelerate the transfer of intellectual property and reduce the amount of time for patenting and licensing of technologies. Using these online tools is seen as a way to streamline and create flexibility in partnering and the selection process, identify and complete the quickest favorable deal in lieu of the perfect one, and increase the speed of deployment. The objectives of these tools are to support licensing, including establishing and checking the status of agreements. There is room for improvement with clear documentation and a process that is straightforward, rapid, transparent and consistent.

Payment and Transactions

There is a demand for improvement and diversification of the payment methods employed for research, development and licensing agreements through incorporation of new tools and systems. Some of the methods presented that could be employed for routine payments and transactions include the use of *pay.gov*, acceptance of credit card sites, and use of secure online spaces for transaction work to aid in shortening times to the execution of agreements. Respondents also recommended the replication of best practices including models that are working well such as the online model for transferring software, or “Express Licenses” such as those used by the National Institutes of Health (NIH) for start-ups along with similar programs at several larger universities as vehicles to consider.

Policy and Agreements

Changes in the current policy that would accelerate technology transfer include loosening some of the lab Conflict of Interest (COI) requirements. This includes encouraging the management of potential COI with entrepreneurial leave and allowing inventors to work

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with startups on a part time basis (as opposed to attempt to completely eliminate any possibility for conflict).

Agreements that provide more flexible terms for quickly establishing industry-friendly agreements were applauded, but not felt to go far enough yet by industry. An example provided was DOE's new "Agreement to Commercialize Technology (ACT)" mechanism. While this is a good start, more industry input and progressive policy change is needed.

Documentation Systems

Several respondents suggested a new consolidated federal integrated online searchable system to showcase technologies and help industry to identify technologies more easily across the federal lab system. The establishment of a unified and integrated web portal with internal and external capabilities to enable the marketing, communications, and transactions related to technology transfer could provide a more thorough process with the potential to reduce associated costs and increase outcomes.

Education

Another area identified to boost the transfer of technology was the improvement of internal and external educational programming. Creating and expanding innovative educational programs such as the "Chief Science Officer Boot Camp" offered by the Mid-Atlantic Region integrates the labs with the community and helps scientists join companies by teaching them skills in important areas. These include communications, project management, personnel, and finance. There is a need for educational programs to assist individuals inside the federal laboratory system better understand the business groups around them and support outreach to connect the labs with technology alliances, angel groups, chambers of commerce, and other organizations. Improved internal educational programs among technology transfer professionals across the federal laboratory system were also suggested to both improve skills and build a network of relationships that establish an interconnected support system. Federal labs can develop partnerships with existing regional educational programs to set up specialized educational efforts relevant for technology transfer, such as the "Certificate in Technology Transfer" now offered by the Foundation for Advanced Education in the Sciences (FAES) Graduate School at the NIH.

Entrepreneurship and Commercialization

There is an increasing focus on entrepreneurship and commercialization of technologies by universities and other public research institutions globally. This is a targeted area by many of the respondents for change and expansion. Some of the suggestions include the use of student programs, business plan conception, development, and competitions, and embedding successful early-stage entrepreneurs in the laboratories. One approach is to establish a virtual spin-out model and to work intensively to mature technology that requires additional development internally and to increase value and reduce risk through development partnerships before exiting the federal laboratory system as a company.

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Funding

It is asserted that current funding models within federal laboratories do not fully incentivize technology maturation and transfer and with adjustments there can be increased attraction for doing business based on intellectual assets with the federal laboratories. Reallocating existing funding or creating new funding sources from within the federal laboratory system for the maturation of early stage technologies is considered a critical step forward in achieving accelerated technology transfer. Internally, this includes the reallocation of operating budgets to support technology development and commercialization with appropriate metrics for results based on development timeframes. Another recommendation is to incentivize with added funding those researchers who successfully contribute to deploy technologies.

Increased options for internal (lab overhead) or external funding to mature technologies through the valley of death is perhaps our current greatest need. A number of ideas for innovative funding sources were presented. One funding source is to establish an enhanced lab technology maturation fund to fill the gap that has emerged with the recent downturn in funding by the early stage investment community. A maturation fund would enable both leveraging of funds with other investments and also help to establish financing relationships with venture capitalists. Seed funds to support prototype development, proof of concept, and beta site testing and demonstration are also needed. Other funding sources and incentives for technology commercialization are to provide access for startups to debt financing, loan guarantees, or tax incentives specifically for commercialization of federally funded inventions. Another suggestion is to give away portfolios with lower licensing or commercialization capacity and bundle these with other funding resources and incentives. DOE Office of Energy Efficiency and Renewable Energy’s now defunct “Technology Maturation Fund” and Los Alamos National Lab’s “LabStart” program are viewed as successful examples.

Facilities

The federal laboratory system has a number of facilities that are available or not fully used to capacity and have the potential to house spinout or startup companies, proof of concept laboratories, or accelerator services. It is seen that creating a means of access for the private sector to work in synergy with the federal laboratories would escalate the creation of products and companies and the associated jobs, revenue and increased economic impact that flows from this process. Business models to accomplish this are sorely needed.

Commercialization Networks

Having effective commercialization networks for technology transfer and commercialization is a matter of balance. The federal laboratories technology transfer professionals are responsible for satisfying researchers, generating revenue and creating economic impact and the balance among these parts of the mission may vary based on the agency or the leadership. Is it possible to create a more consistent direction and intended outcomes at the national level and across agencies? Federal government funding is becoming more focused on outcomes and jobs, but the alignment to achieve job creation through technology

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commercialization from the federal laboratory systems technologies and technology transfer is not fully aligned with this mission. The key is collaborative networks. Within the FLC, it would be great to see commercialization function within the FLC as a more effective network. A number of responses addressed how FLC could better support commercialization as an enabling network that uses federal labs as a resource for commercialization.

Connecting to local and regional community commercialization and economic development networks will encourage getting out of the federal labs and working with individuals and organizations in the community. The enhancement of academic and industry partnering and mentoring was also suggested. Programs that encourage work between small businesses and the federal laboratories to accelerate their success have become a valuable development resource. This outreach has been demonstrated to help businesses work with labs and to establish less threatening and higher value partnerships

Conclusion

Posing the question “If the sky were the limit, what could the federal labs do differently to accelerate technology transfer?” members of the U.S. innovation ecosystem and the Federal Laboratory Consortium responded with key observations on the current status of technology transfer and recommendations for change. These recommendations are intended to improve, create, or engage new resources, processes, and systems that accelerate technology transfer and improve the experience of doing business with the federal laboratories. Areas for improvement include culture, elevation and integration of mission, marketing communications and outreach, process, education, and entrepreneurship and commercialization.

Some of the drivers addressed included the use of online tools for marketing communications, financial transactions and documentation, and establishing an enhanced Web portal to integrate the federal laboratory system’s technology transfer efforts. A concerted transition in the culture and operations to become more outwardly focused, flexible, and present in industry engagement, community involvement and commercialization networks was also suggested. Finally, creating and engaging new means to support early stage technology development and deployment through funding, facilities use, and changes in policy were recommended to accelerate commercial outcomes.

This compilation of ideas is intended to help guide the ongoing process of reinvention within FLC and the federal lab system; to actively promote the fullest application and use of federal research and development by providing an environment for successful technology transfer. By working together and rethinking limits, we can achieve much more significant outcomes from the investment in our federal laboratories and the global impact that they can make.